PATENT APPLICATION

SYSTEMS AND METHODS FOR IMPLEMENTING A CONTENT OBJECT ACCESS POINT

Inventor(s):   Steven M. Casey, a citizen of The United States, residing at
6265 West Sumac Avenue
Littleton, CO 80123

Bruce A. Phillips, a citizen of The United States, residing at
1342 Washburn Street
Erie, CO 80516

Assignee: Qwest Communications International Inc
Law Department, 1801 California Street, Suite 3800
Denver, CO 80202-2658

Entity: Large

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, 8th Floor
San Francisco, California 94111-3834
Tel: 303-571-4000

SYSTEMS AND METHODS FOR IMPLEMENTING A CONTENT OBJECT ACCESS POINT

CROSS-REFERENCES TO RELATED APPLICATIONS

5   [0001]   The present application is related to U.S. Pat. App. No. _____ (Attorney Docket No. 020366-091200US) entitled "Systems And Methods For Controlled Transmittance in a Telecommunication System", and filed by the inventors common hereto and on a date common herewith. The entirety of the aforementioned application is incorporated herein by reference for all purposes.

10

BACKGROUND OF THE INVENTION

[0002]   The present invention is related to telecommunication systems in general, and in particular to systems and methods for distributing content objects.

[0003]   The telecommunication and electronics industries have developed and implemented
15   a large number of incompatible devices and protocols. Thus, in a given consumer's home you can find a number of different types of content maintained in a number of different media. To use such content object types, a user is required to access multiple devices. Further, such content typically cannot be used together without requiring the use of multiple devices, each respectively using a portion of the content.

20   [0004]   Hence, among other things, there exists a need in the art to address the aforementioned limitations.

BRIEF SUMMARY OF THE INVENTION

[0005]   The present invention is related to telecommunication systems in general, and in
25   particular to systems and methods for distributing content objects. Various of the systems and methods utilize a number of content object entities that can be sources and/or destinations for content objects. A combination of abstraction and distinction engines can be used to access content objects from a source of content objects, format and/or modify the content objects, and redistribute the modified content object to one or more content object
30   destinations. In some cases, an access point is included that identifies a number of available

content objects, and identifies one or more content object destinations to which the respective content objects can be directed.

[0006]   Such systems and methods can be used to select a desired content object, and to select a content object entity to which the content object is directed. In addition, the systems and methods can be used to modify the content object as to format and/or content. For example, the content object may be reformatted for use on a selected content object entity, modified to add additional or to reduce the content included in the content object, or combined with one or more other content objects to create a composite content object. This composite content object can then be directed to a content object destination where it can be either stored or utilized.

[0007]   Some embodiments of the present invention provide systems for abstraction and distinction of content objects. These systems include an abstraction engine and a distinction engine. The abstraction engine is communicably coupled to a group of content object entities, and the distinction engine is communicably coupled to another group of content object entities. The two groups of content object entities are not necessarily mutually exclusive, and in many cases, a content object entity in one of the groups is also included in the other group. The first of the groups of content object entities includes content objects entities such as an appliance control system, a telephone information system, a storage medium including video objects, a storage medium including audio objects, an audio stream source, a video stream source, a human interface, the Internet, and an interactive content entity. The other of the groups of content object entities includes content object entities such as an appliance control system, a telephone information system, a storage medium including video objects, a storage medium including audio objects, a human interface, the Internet, and an interactive content entity.

[0008]   In some instances, two or more of the content object entities are maintained on separate partitions of a common database. In such instances, the common database can be partitioned using a content based schema, while in other cases the common database can be partitioned using a user based schema.

[0009]   In particular instances, the abstraction engine is operable to receive a content object from one of the groups of content object entities, and to form the content object into an abstract format. As just one example, this abstract format can be a format that is compatible at a high level with other content formats. In other instances, the abstraction engine is

2

operable to receive a content object from one of the content object entities, and to derive another content object based on the aforementioned content object. Further, the abstraction engine can be operable to receive yet another content object from one of the content object entities and to derive an additional content object there from. The abstraction engine can then

5   combine the two derived content objects to create a composite content object. In some cases, the distinction engine accepts the composite content object and formats it such that it is compatible with a particular group of content object entities. In yet other instances, the abstraction engine is operable to receive a content object from one group of content object entities, and to form that content object into an abstract format. The distinguishing engine

10   can then conform the abstracted content object with a standard compatible with a selected one of another group of content object entities.

[0010]   In some other instances, the systems include an access point that indicates a number of content objects associated with one group of content object entities, and a number of content objects associated with another group of content object entities. The access point

15   indicates from which group of content object entities a content object can be accessed, and a group of content object entities to which the content object can be directed.

[0011]   Other embodiments of the present invention provide methods for utilizing content objects that include accessing a content object from a content object entity; abstracting the content object to create an abstracted content object; distinguishing the abstracted content

20   object to create a distinguished content object, and providing the distinguished content object to a content object entity capable of utilizing the distinguished content object. In some cases, the methods further include accessing yet another content object from another content object entity, and abstracting that content object entity to create another abstracted content object entity. The two abstracted content object entities can be combined to create a composite

25   content object entity. In one particular case, the first abstracted content object is a video content object and the second abstracted content object is an audio content object. Thus, the composite content object includes audio from one source, and video from another source. Further, in such a case, abstracting the video content object can include removing the original audio track from the video content object prior to combining the two abstracted content

30   objects. As yet another example, the first abstracted content object can be an Internet object, while the other abstracted content object is a video content object.

[0012]   In other cases, the methods can further include identifying a content object associated with one group of content object entities that has expired, and removing the identified content object. Other cases include querying a number of content object entities to identify one or more content objects accessible via the content object entities, and providing an access point that indicates the identified content objects and one or more content object entities to which the identified content objects can be directed.

[0013]   Yet other embodiments provide methods for accessing content objects within a customer premises. Such methods include identifying content object entities within the customer premises, and grouping the identified content objects into two or more groups of content object entities. At least one of the groups of content object entities include sources of content objects, and at least another of the groups of content object entities include destinations of content objects. The methods further include providing an access point that indicates the at least one group of content object entities that can act as content object sources, and at least another group of content object entities that can act as content object destinations. In some cases, the methods further include mixing two or more content objects from the first plurality of content object entities to form a composite content object, and providing the composite content object to a content object entity capable of utilizing it. In other cases, the methods further include eliminating a portion of a content object accessed from one group of content object entities and providing this reduced content object to another content object entity capable of utilizing the reduced content object entity.

[0014]   This summary provides only a general outline of some embodiments according to the present invention. Many other objects, features, advantages and other embodiments of the present invention will become more fully apparent from the following detailed description, the appended claims and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]   A further understanding of the nature and advantages of the present invention may be realized by reference to the figures which are described in remaining portions of the specification. In the figures, like reference numerals are used throughout several figures to refer to similar components. In some instances, a sub-label consisting of a lower case letter is associated with a reference numeral to denote one of multiple similar components. When

reference is made to a reference numeral without specification to an existing sub-label, it is intended to refer to all such multiple similar components.

[0016]   Fig. 1 illustrates a block diagram of an abstraction and distinction engine in accordance with various embodiments of the present invention;

[0017]   Fig. 2 illustrates a hierarchical diagram of various content object entities accessible via the abstraction and distinction engine of Fig. 1; and

[0018]   Figs. 3 illustrate various applications of the abstraction and distinction engine of Fig. 1 in accordance with various embodiments of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0019]   The present invention is related to telecommunication systems in general, and in particular to systems and methods for distributing content objects. In some embodiments of the present invention, a content access point is provided that includes a guide to various content objects maintained in relation to a customer premises. In some cases, this content access point is implemented as a combination of hardware and software, however, one of ordinary skill in the art will appreciate a variety of implementation methods that can be used in accordance with the present invention. Via a guide associated with the access point, a list of all content objects available to a consumer can be displayed, and commands requesting various of the content objects and/or portions thereof can be received and processed. Thus, in some cases, the present invention provides a unifying tool allowing a consumer to access a variety of content objects from a variety of content object entities, manipulate those content objects, and utilize those content object via one or more content object entities.

[0020]   As used herein, a content object can be any content maintained as an accessible object that can be accessed, utilized, and/or stored. Thus, for example, a content object can include, but is not limited to, voicemail, email, video, audio, movies, music, games, email, live broadcasts, user preferences, appliance status information, documents, Internet web pages, and the like. Further, as used herein a content object entity can be any entity capable of storing, sourcing, and/or utilizing a content object. In some cases, content object entities are classified as content object sources, content object destinations, or a combination thereof. Thus, for example, a voice mail system may be both a content object destination and a content object source. This is because the voice mail system can be both a source of audio content objects and a destination for an audio content object. Other examples of content

5

object entities include, but are not limited to, appliance watch systems, caller identification systems, call logging systems, databases of recorded video and/or audio objects, sources of live video and/or audio objects, human interfaces, the Internet, databases of interactive content, databases of documents, video players, audio players, and/or graphical displays.

5 Based on the disclosure provided herein, one of ordinary skill in the art will appreciate the myriad of content objects and/or content object entities that can be utilized in relation to embodiments of the present invention.

[0021] Various of the systems and methods utilize a number of content object entities that can be sources and/or destinations for content objects. A combination of abstraction and distinction engines can be used to access content objects from a source of content objects,

10 format and/or modify the content objects, and redistribute the modified content object to one or more content object destinations. In some cases, an access point is included that identifies a number of available content objects, and identifies one or more content object destinations to which the respective content objects can be directed.

15 [0022] Such systems and methods can be used to select a desired content object, and to select a content object entity to which the content object is directed. In addition, the systems and methods can be used to modify the content object as to format and/or content. For example, the content object may be reformatted for use on a selected content object entity, modified to add additional or to reduce the content included in the content object, or

20 combined with one or more other content objects to create a composite content object. This composite content object can then be directed to a content object destination where it can be either stored or utilized.

[0023] Some embodiments of the access point, abstraction engine, and/or distinction engine are implemented as an appliance that can be attached to a network interface device (NID) to

25 provide a convenient content object access point for a customer premises. Alternatively, the abstraction and/or distinction engine can be implemented as a microserver associated with the NID. Information about such NIDs and microservers can be obtained from U.S. Application Ser. No. 10/377,282, filed February 27, 2003 by Casey *et al.* and entitled "Systems And Methods For Displaying Data Over Video"; U.S. Application Ser. No. 10/356,364, filed

30 January 31, 2003 by Phillips *et al.* and entitled "Packet Network Interface Device And Systems And Methods For Its Use"; U.S. Application Ser. No. 10/356,688, filed January 31, 2003 by Phillips *et al.* and entitled "Systems, Methods And Apparatus For Providing A

Plurality Of Telecommunications Services"; U.S. Application Serial No. 10/356,338, filed January 31, 2003 by Phillips *et al.* and entitled "Configurable Network Interface Device And Systems And Methods For Its Use"; U.S. Application Ser. No. 10/367,596, filed February 14, 2003 by Casey *et al.* and entitled "Systems And Methods For Delivering A Data Stream To A Video Appliance"; U.S. Application Ser. No. 10/367,597, filed February 14, 2003 by Casey *et al.* and entitled "Systems And Methods For Providing Application Services"; U.S. Application Ser. No. 10/377,290, filed February 27, 2003 by Phillips *et al.* and entitled "Systems And Methods For Forming Picture-In-Picture Signals"; U.S. Application Ser. No. 10/377,283 filed February 27, 2003 by Phillips *et al.* and entitled "Systems And Methods For Monitoring Visual Information"; U.S. Application Ser. No. 10/377,584 filed February 27, 2003 by Phillips *et al.* and entitled "Systems And Methods For Delivering Picture-In-Picture Signals At Diverse Compressions And Bandwidths"; U.S. Application Ser. No. 10/377,281 filed February 27, 2003 by Phillips *et al.* and entitled "Systems And Methods For Providing And Displaying Picture-In-Picture Signals"; U.S. Application Ser. No. 10/444,941, filed May 22, 2003 by Phillips *et al.* and entitled "Systems And Methods For Providing Television Signals Using A Network Interface Device"; U.S. Application Ser. No. 10/448,249, filed May 22, 2003 by Phillips *et al.* and entitled "Methods And Apparatus For Delivering A Computer Data Stream To A Video Appliance With A Network Interface Device"; and U.S. Application Ser. No. –/——, filed July 21, 2003 by Casey *et al.* and entitled "Systems And Methods For Integrating Microservers With A Network Interface Device" (attorney docket no. 020366-089500US). Each of the aforementioned patent applications share one or more inventors, and are assigned to an entity common hereto. Further, the entirety of each of the aforementioned patent applications is incorporated herein by reference for all purposes.

[0024] This appliance may include a guide that incorporates a broad range of content media into a single access point. This range of content media can include, but is not limited to, traditional content including movies, music, games, voicemails, emails, software, security video, emergency alerts, and any other content that comes to the home or can be requested from the network via providers.

[0025] Some embodiments of the present invention provide systems for abstraction and distinction of content objects. These systems include an abstraction engine and a distinction engine. The abstraction engine is communicably coupled to a group of content object entities, and the distinction engine is communicably coupled to another group of content object entities. The two groups of content object entities are not necessarily mutually

exclusive, and in many cases, a content object entity in one of the groups is also included in the other group. The first of the groups of content object entities includes content objects entities such as an appliance control system, a telephone information system, a storage medium including video objects, a storage medium including audio objects, an audio stream source, a video stream source, a human interface, the Internet, and an interactive content entity. The other of the groups of content object entities includes content object entities such as an appliance control system, a telephone information system, a storage medium including video objects, a storage medium including audio objects, a human interface, the Internet, and an interactive content entity.

[0026]   In particular instances, the abstraction engine is operable to receive a content object from one of the groups of content object entities, and to form the content object into an abstract format. As just one example, this abstract format can be a format that is compatible at a high level with other content formats. In other instances, the abstraction engine is operable to receive a content object from one of the content object entities, and to derive another content object based on the aforementioned content object. Further, the abstraction engine can be operable to receive yet another content object from one of the content object entities and to derive a an additional content object there from. The abstraction engine can then combine the two derived content objects to create a composite content object. In some cases, the distinction engine accepts the composite content object and formats it such that it is compatible with a particular group of content object entities. In yet other instances, the abstraction engine is operable to receive a content object from one group of content object entities, and to form that content object into an abstract format. The distinguishing engine can then conform the abstracted content object with a standard compatible with a selected one of another group of content object entities.

[0027]   Turning to Fig. 1, a combination guide, abstraction, and distinction system 100 in accordance with various embodiments of the present invention is illustrated. System 100 includes a guide 110, a control 120, and abstraction/distinction engine 130, and a number of content object entities 150-164. Content object entities 150-164 can include, but are not limited to, an appliance control system 150, a telephone information system 151-153, a storage medium including video objects 154, a storage medium including audio objects 155, an audio stream source 159-161, a video stream source 156-158, a human interface 162, the Internet 163, and an interactive content entity 164. Human interface 162 can be an audio reception device for encoding voice data, a keyboard, a pen interface, a display including

8

televisions, and audio player, and/or the like. Interactive content entity 164 can be a computer program that provides responses to a user based on a user's actions. Live video and audio sources may include feeds from multiple sources. For example, live video stream 156 may include a feed from a cable television provider for source one 157, and from an antenna

5   for source two 158. Based on this disclosure, one of ordinary skill in the art will appreciate that any number of video sources or channels may be provided via a common live video content object entity. Similarly, one of ordinary skill in the art will appreciate that any number of audio sources or channels may be provided via a common live audio content object entity. Further, one of ordinary skill in the art will recognize other content object

10   entities to which the systems and methods of the present invention can be directed.

[0028]   As previously discussed, these various content object entities 150-164 can be organized into groups of content object entities 180, 190. One group of content object entities 180 can include, for example, all content object entities that are capable of acting as a content object destination. Thus, for example, this group may include a television capable of

15   receiving and displaying video content objects. Another group of content object entities 190 may include all content object entities that are the source of content objects. Thus, for example, live video feed 156 may be included in this group. It will be appreciated that some of the content object entities can be included in both of the aforementioned groups.

[0029]   In some embodiments of the present invention, control 120 queries each of content

20   object entities 150-164 to determine content objects available, format of the content objects, and content objects entities and content formats that the content object entities are capable of utilizing. Thus, for example, a query of live video feed 156 would indicate a number of content objects corresponding to available video channels, but would not indicate that live video feed 156 can utilize any content objects. Alternatively, a query of human interface 162

25   may indicate a television capable of receiving and utilizing content objects in a particular video format, but not providing any sourced content objects.

[0030]   Using this query information, control 120 assembles a listing of all available content objects and the respective formats of the content objects. In addition, control 120 assembles a listing of all content object entities capable of receiving content objects, and the content

30   object format that each content object entity is capable of supporting. Further, control 120 identifies all format conversions that can be provided by abstraction/distinction engine 130. From this information control 120 creates a guide 110 that indicates all available content

objects, and all content object entities to which the available content object entities can be directed.

[0031] Various examples are provided to illustrate the process. In the first, a television capable of receiving an NTSC signal is identified as a content object entity (human interface 162), and live video source 156 providing an NTSC video stream is identified as another content object entity. Thus, guide 110 includes a listing for video source 156 indicating that the content object can be displayed on the identified television. The second example expands on the first where a computer display capable of displaying raster video signals is identified, and abstraction/distinction engine 130 includes capability for converting an NTSC video signal to a raster format signal. Thus, guide 110 would include a listing for video source 156 indicating that the content object can be displayed on either the television or the computer display.

[0032] As yet another example, control 120 may identify an MPEG video content object maintained on recorded video media 154, and an uncompressed recorded audio content object on recorded audio media 155. Further, control 120 may identify a television capable of displaying an NTSC signal including both audio and video, and identify decompression capability and NTSC conversion capability in abstraction/distinction engine 130. Thus, guide 110 would list the MPEG video content object indicating that it can be displayed on the identified television, and listing the audio object indicating that it can also be displayed on the identified television.

[0033] Thus, as just one exemplary use of system 100, a user could select both the audio content object and the video content object and indicate that a combination of the two objects are to be displayed on the identified television. This selection would be passed by control 110 to abstraction/distinction engine 130. In turn, abstraction/distinction engine 130 can access the MPEG video content object from recorded video media 154, and decompress the MPEG video content object to create an uncompressed digital video object. This process is generically referred to herein as abstracting -- or converting a content object from one format and/or location to a more generally usable format and/or location. Also, abstraction/distinction engine 130 accesses the audio content object. Such an access can also be referred to as abstracting as the content is being moved to a more accessible location. Then, the audio and video content objects can be merged to create a composite content object. This composite content object can then be modified by abstraction/distinction engine

130 into a format compatible with the identified television. Thus, the digital audio and video are merged, and subsequently converted to an NTSC video signal that is then passed to the identified television for display. This process of modification into an NTSC is one form of distinction. The present invention can employ various forms of distinction all generically

5   referred to herein as distinction or distinguishing. In general, distinction includes modifying the format of a content object and/or moving the content object to a content object entity where it can be displayed.

[0034]   As yet another example, a user can request a web page to record a broadcast movie. In such a case, guide 110 may be displayed as a web page accessible to the user. Via guide

10   110, a request for a selected content object indicating that the content object is to be directed to a digital video recorder can be received. The request can be passed to a NID associated with a customer premises, and from the NID, the request can be passed to control 120. Control 120 can convert the request packet and determine which of the various content object entities has access to the requested content object. Based on this information, control 120 can

15   direct abstraction/distinction engine 130 to access the requested content object from the Internet 163 at the specified Internet address, and to format the received information in a format compatible with the selected digital video recorder. Thus, abstraction engine 130 accesses the Internet 163 and retrieves an web page including a video stream. This video stream can then be converted to a digital video format compatible with the digital video

20   recorder. Once the recording is complete, an alert can be sent to control 120. The recorded video is then maintained as a content object on the digital video recorder. This content object can then be accessed and sent to other content object entities.

[0035]   As a modification of the previous example, control 120 may include a machine interface that can be programmed with a user's preferences. Based on these preferences,

25   control 120 can query the various content object entities to identify programs that match the preferences, and to automatically record those programs to a digital recorder. Thus, the digital recorder may be automatically populated with a number of content objects matching the user's preferences. These content objects can be derived from a number of different content object entities, and can all be abstracted and/or distinguished such that they exist in a

30   common file format compatible with the digital recorder. In turn, these content objects can be requested from the digital recorder, and abstracted and/or distinguished for utilization on another content object entity. In some cases, the user's preferences can be derived from monitoring the user's access habits. In addition, guide 110 may also include other content

11

guides available from various content object entities. These can include, for example, channel lineups, television guides, video on demand schedules, and/or the like.

[0036] Based on the disclosure provided herein, one of ordinary skill in the art will appreciate a number of format conversions that can be performed by abstraction/distinction engine 130. Such format conversions can include compression, decompression, encryption, decryption, conversions between data types, and/or the like. format modification. The following lists just some examples of possible conversions: an MPEG2 to MPEG4 conversion, an MPEG to a proprietary video standard conversion, video resolution adjustments for display on a variety of monitor types, speech to text (*e.g.*, voicemail to email), text to speech (e.g., email to voicemail), text to text (*e.g.*, home caller ID to cell phone caller ID), data to text (*e.g.*, alerts from appliances indicating a change of state such as, for example, a door opening), data to HTML or other computer formats (*e.g.*, requests from a digital recorder to serve a web page), HTML resolution adjustments allowing the HTML to be displayed in a different resolution environment. Again, based on this disclosure, one of ordinary skill in the art will appreciate that the systems and methods of the present invention can be applied in relation to a number of other conversions.

[0037] Systems in accordance with the present invention can support a large number of content object types. Such content object types can include, but are not limited to, recorded video content from content providers, recorded security footage from home/remote cameras, real-time video baby monitors, real-time computer usage monitoring via picture-in-picture display, recorded incoming voicemails, recorded outgoing voicemail greetings, voice over IP, caller-id, PSTN caller-id, call Logs, on Screen TV guide, on screen internet broadcast guide, alerts from emergency alert system, digital recorder requests from a web page, software downloads for internet, video on demand, audio on demand, games on demand, and/or the like. Based on this disclosure, one of ordinary skill in the art will appreciate a number of other content object types that can be used in relation to the present invention.

[0038] Further, abstraction/distinction engine 130 can be updatable by adding additional software offering different conversions as the need arises. Thus, for example, where a user installs a new voice mail system, conversion software capable of accepting audio content objects from the new voice mail system, and for converting the audio signals to a standard digital audio signal can be added. Thus, the conversion software can be updated to allow

content objects from one of content object entities 150-164 to be utilized by a large number of other content object entities.

[0039]   Also, based on the disclosure provided herein, one of ordinary skill in the art will recognize a number of uses for system 100. Such uses can include, but are not limited to,

5   utilizing content objects on content object entities where the content object otherwise would not be used, combining content objects to create composite content objects, and/or providing a user friendly selection point for a large variety of content object types. It should also be recognized that the output of abstraction/distinction engine 130 can be formatted for display on a content object entity, or for additional processing by another content object entity.

10   [0040]   In particular embodiments of the present invention, a machine interface is provided that allows a user to program control 120 to define the types of content objects that the user would like displayed, and which content object entity the user would like to use for display. In this way, the user can simplify guide 110 making it more accessible and/or useful to the user. Alternatively, or in addition, the user may select a content object entity, and guide 110

15   can present a list of all content objects that can be utilized by the selected content object entity.

[0041]   In some cases, various recorded data can be maintained across content object entities in different logical or physical partitions. Thus, for example one user in a customer premises may be allotted a certain physical storage space on one or more content object

20   entities. Once the user's storage space is exhausted, one or more content objects will need to be removed from the user's storage space before an additional content object can be added. Alternatively, or in addition, the partition can be logical. Such a partition can segregate content objects for use by parents and children within the same customer premises.

[0042]   Thus, guide 110 can also assemble access information indicating which user and/or

25   group of user's can access a particular identified content object. For example, in a customer premises there could be three different personal video recorders all attached to the network. Control 120 could access all of these devices to create a central guide 110. The table of gathered information could appear as the following exemplary table:

Content Name	Description	License Info	Device Name (DNS Name)	Location (Local/Remote)	Distribution	Access Group

Scooby Doo	Video - Carton	Full Usage	PVR1.NID-IP	Local	World	United States
Terminator	Video – Action	1 Time View	PVR2.NID-IP	Local	State	United States
Blink 182 Concert	Audio – Music Video	Full Usage	www.music.com	Remote	City	Denver, CO
Voicemails	Voicemail	Full Usage	Voicemail.NID-IP	Local and Remote (Second Copy)	Home	Casey Family Only

[0043]   Turning to Fig. 2, a hierarchical diagram 200 illustrates various content object entities 201-206 accessible via the abstraction and distinction engine 130 illustrated in Fig. 1. In particular, hierarchical diagram 200 illustrates one approach in accordance with some embodiments of the present invention for removing expired content objects. Content objects can either be expired after a specified time or after a predetermined number of uses of the content object (e.g., the content object is consumed). As illustrated, content objects can be moved from a first tier of content object entities 201-206, to a second tier of content object entities 211-213 maintained as a more accessible storage area. Content objects are passed to this more accessible storage area based on priorities and expiration information. Thus, content object entities 201-206 can be queried by control 120 to identify content objects available thereon. The status of each of the identified content objects is determined by a content priorities engine 220. Determination of status includes a determination of whether the identified content object has expired 225, and a ranking of the identified content object as to importance 227 relative to other identified content objects. For example, priority can be based on the importance of the user for which the content object is being moved, or for the likelihood that the content object will be utilized.

[0044]   In addition to the standard expiration of content objects, a feature can be set to store critical information and delete other data when there is no other space available. For example, video content objects could be expired if storage for voicemails and emails is exhausted and needs to be expanded to support incoming messages. The user and/or a service provider providing a NID can define these options.

[0045]   To support additional storage, content can be moved to secondary storage automatically as space is required. This can be performed automatically after a specific

condition is met (*e.g.*, after ten days content objects can be moved to secondary storage), or manually via a user request (*e.g.*, watch a movie and then record to DVD). Another example of an automatic record would be to copy all content to secondary storage to CD-ROMs if it is audio based. This solution will free up space on a space-constrained system. Further, in

5   some cases, system 100 can include the ability to automatically copy any backup data to the new drive once it was replaced. The data that is set for backup would be user configurable. This system could use standard data protection schemes like Disk Mirroring and Stripping as are known in the art.

[0046]   Some embodiments of the present invention further include a license monitoring

10   application. This application can allow a user to purchase a content object, and to remove the content object once the license has expired, and/or to limit access to the content object to accesses that conform to the terms of the license. In some cases, the licenses can be stored separate from the content objects to which the licenses are related. Thus, when a content object is selected, an access to the license is also initiated. A separate interface can be

15   provided for storing licensed content objects to an offline media (*i.e.*, CD-ROMs, Flash Cards, or external drives). When the content object is selected, an associated license is queried and where the license is valid, the content object is accessed from the offline media. If any of the content object is presented in an encrypted format, the license will provide rights to access one or more decryption keys useful for decrypting the content object.

20   [0047]   Figs. 3 graphically represent examples in accordance with the present invention for utilizing system 100. Turning to Fig. 3a, a graphical representation 301 of system 100 combining an audio content object 311 with a video content object 312 is illustrated. Audio content object 311 can be, for example, a streaming audio signal available from the Internet, while video content object 312 can be, for example, a cable television channel. Audio

25   content object 311 and video content object 312 are abstracted by abstraction/distinction engine 130 to a combinable format. Then, audio content object 311 and video content object 312 are combined 321, and the combined signals are distinguished for utilization by a determined content object entity. Upon distinction, a composite content object 331 is formed.

[0048]   It will be appreciated that system 100 can include the ability to combine a number

30   of different content object types including, for example, audio, video, or data tracks to produce enhanced content specified by the user. The example of graphical representation 301 would be very useful where a user is watching a sporting event on television, but would

rather listen to the play calling provided on a radio station available over the Internet. System 100 thus accesses only the video portion of the television program, and synchronizes it with the audio portion. This synchronization can include delaying one or the other portions such that they align. This delaying function can be aided by a user that can indicate when the two portions have been synchronized. Thus, for example, the program may be displayed with increasing amounts of delay added to one or the other segments until the user indicates that the delay is correct. Once the delay is correct, the program combination continues.

[0049] Turning to Fig. 3b, a graphical representation 302 illustrates another exemplary use of system 100 in accordance with other embodiments of the present invention. In this example, only the audio portion of a television program is recorded. In operation, the content object entity supplying the television program is selected, and an audio only content object entity is selected to receive the program. Abstraction/distinction engine 130 separates the audio and video portions of the selected television program, and provides the audio portion to the selected content object entity. The selected content object entity can be, for example, a CD recorder, an MP3 player, a radio, and/or the like.

[0050] Turning to Fig. 3c, a graphical representation 303 illustrates yet another exemplary use of system 100 in accordance with other embodiments of the present invention. In this example, a video content object 312 is combined with a data stream content object 313 obtained from the Internet. The combination creates a composite content object 351. A clock 321 can be used to synchronize the content objects and the video content object can be tagged 361 to identify where in the video stream the data is to be added. In this way video programming can be augmented to include additional details and background information based on the video program.

[0051] The invention has now been described in detail for purposes of clarity and understanding. However, it will be appreciated that certain changes and modifications may be practiced within the scope of the appended claims. Accordingly, it should be recognized that many other systems, functions, methods, and combinations thereof are possible in accordance with the present invention. Thus, although the invention is described with reference to specific embodiments and figures thereof, the embodiments and figures are merely illustrative, and not limiting of the invention. Rather, the scope of the invention is to be determined solely by the appended claims.